

Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

Contract No.: 53-3198-3-038
MPR Reference No.: 8156-004

THE HEALTHY EATING INDEX

FINAL REPORT

December 1994

Authors:

Eileen Kennedy
James Ohls
Steven Carlson
Katherine Fleming

Submitted to:

U.S. Department of Agriculture
Food and Nutrition Service
Office of Analysis and Evaluation
3101 Park Center Drive, 2nd Fl.
Alexandria, VA 22302

Project Officer:
Steven Carlson

Submitted by:

Mathematica Policy Research, Inc.
P.O. Box 2393
Princeton, N.J. 08543-2393
(609) 799-3535

Project Director:
James Ohls

ACKNOWLEDGMENTS

The authors would like to thank the many people who provided valuable help in this project. Throughout the project, conceptual and technical assistance was provided by a four member Expert Panel which included Jeanne Goldberg, Pamela Haines, Helen Jensen, and Suzanne Murphy. Their willingness to share ideas and provide quick feedback at key design junctures was invaluable.

At the U.S. Department of Agriculture, Food and Consumer Service, Patricia McKinney made direct contributions to several stages of the research and provided useful comments on others. Other important input was received from Margaret Andrews, Sharron Cristofar, and Jay Hirschman.

Tom Fraker and Harold Beebout of MPR made important suggestions about the work. Barbara Foot and Kimball Lewis contributed substantially to developing the index. Robert Cohen and Karen Pence provided extraordinary programming support.

CONTENTS

	Page
THE HEALTHY EATING INDEX	1
A. STRUCTURE OF THE INDEX	1
1. Components 1-5: Grains and Other Foods	2
2. Component 6: Overall Fat as a Percentage of Food Energy	3
3. Component 7: Saturated Fat	3
4. Components 8 and 9: Cholesterol and Sodium	3
5. Component 10: Variety	3
B. DATA USED TO CALCULATE THE INDEX	4
C. TECHNICAL DETAILS	5
1. Portion Sizes	5
2. Dealing with "Mixtures" in Computing Group Scores	9
3. Calculating Serving Requirements by Age and Gender	9
4. Measuring Variety by Grouping Foods for the Variety Component of the Index	12
5. Alternatives Considered and Rejected	14
D. TABULATIONS OF THE INDEX	16
1. Average Overall Scores	16
2. Component Scores	16
3. Correlation with RDAs Attained	19
4. Differences by Person and Household Characteristics	19
REFERENCES	23
APPENDIX A: CODING FOODS INTO FOOD PORTIONS BY FOOD GROUP	A.1
APPENDIX B: PORTION SIZE COMPARISONS	B.1
APPENDIX C: VARIETY CODING	C.1

TABLES

Table		Page
1	RECOMMENDED NUMBERS OF SERVINGS PER DAY AT FOOD ENERGY LEVELS DISCUSSED IN THE FOOD PYRAMID BOOKLET	10
2	RECOMMENDED NUMBER OF SERVINGS PER DAY AT ADDITIONAL FOOD ENERGY LEVELS	11
3	PERSONS BY INDEX LEVEL	17
4	LEVELS OF INDEX COMPONENTS	18
5	PERCENT OBSERVATIONS MEETING 75 PERCENT OF RDA BY INDEX LEVELS	20
6	MEAN INDEX SCORES BY HOUSEHOLD CHARACTERISTICS	21

THE HEALTHY EATING INDEX

The Healthy Eating Index is a measure of how well the American diet conforms to generally accepted recommendations for healthy eating patterns. The index, developed by the U.S. Department of Agriculture (USDA), with assistance from Mathematica Policy Research, Inc. (MPR), examines dietary intake in relation to the five major food groups specified by USDA's "Food Pyramid" and in the context of other guidelines for fats, cholesterol, sodium, and dietary variety.

The current version of the Healthy Eating Index, which is preliminary, is still being tested and refined. In order to allow additional review and elicit comments, this report summarizes how the current version of the index is computed. Section A describes the structure of the index and explains how its components are scored. Section B describes the data used to compute the index. Section C contains a detailed technical explanation of how the index components are calculated. Tabulations of the index are presented in Section D.

The Healthy Eating Index builds on a number of previous studies which have sought to develop indices of the quality of diets. (See, most importantly, Patterson et al., 1994. Also, Guthrie and Scheer, 1981.) While many of the ideas presented below are drawn from this past work, the current research significantly extends the previous work in a number of areas including: tying the index closely to the recommendations of the Food Pyramid and to the national dietary guidelines, the use of more detailed techniques than have previously been employed for allocating mixed foods to food groups, and the use of an innovative measure of dietary variety.

A. STRUCTURE OF THE INDEX

The Healthy Eating Index has 10 components, which are based on different aspects of a healthy diet. For each component, individuals receive a score ranging from 0 to 10. Thus, the overall index has a range from 0 to 100. The components are defined as follows:

- Components 1 through 5 measure the degree to which a person's diet conforms to USDA Food Pyramid serving recommendations for 5 major food groups: grains, vegetables, fruits, dairy, and meats.
- Component 6 is based on *overall fat* consumption as a percentage of total food energy intake.
- Component 7 is based on *saturated fat* consumption as a percentage of total food energy intake.
- Component 8 is based on *cholesterol* intake.
- Component 9 is based on *sodium* intake.
- Component 10 is based on the amount of *variety* in a person's diet.

1. Components 1-5: Grains and Other Foods

The Food Pyramid booklet specifies that adults should eat 6 to 11 servings of grain, depending on their overall food energy intake; the booklet also presents a table showing the number of servings¹ recommended at intakes of 1600, 2200, and 2800 kilocalories. In developing the index these serving recommendations were interpolated to persons with other recommended food energy levels.² A person who consumes at least his or her recommended level of servings of grains receives a maximum score of 10 on this component; a person who eats no grains receives 0. Between these extremes, the score is calculated proportionately. For instance, suppose that Person A has a recommended level of 8 servings. If she or he eats 4 servings, the component score is 5 points; if 6 servings are eaten, the score is 7.5 points.

Scores for each of the other four components based on the Food Pyramid are calculated in essentially the same way as scores for grains. Actual servings are compared to servings recommended based on the Food Pyramid booklet. However, one additional factor, involving legumes, was taken

¹Technical issues concerning how servings are defined are discussed in Section C below.

²The interpolation processes are described in Section C. For children with food energy RDA below 1,600, the minimum number of servings was kept at 6, but the serving sizes were scaled down proportionately on the basis of RDA requirements. For adult males with food energy RDA above 2,800, the required serving number was set at 11.

into account. The Food Pyramid counts legumes as meats or vegetables. When the index scores are calculated, legumes are assigned to the meat group up to the point needed to achieve the maximum meat score. Additional legumes are assigned to the vegetable group.³

2. Component 6: Overall Fat as a Percentage of Food Energy

A score of 10 is given for the overall fat component if the intake of fat as a proportion of food energy is less than or equal to .30. The score drops to 0 when this proportion reaches .45. Between these points, the score is calculated proportionately.

3. Component 7: Saturated Fat

The score for saturated fat is computed in the same way as the score for total fat. The maximum score is achieved at a ratio of .10, and the zero point is set at .15.

4. Components 8 and 9: Cholesterol and Sodium

The scores for cholesterol and sodium are based on milligrams consumed. The cutoff points for maximum component scores are set at 300 and 2400, respectively. The corresponding zero score levels are 450 and 4800. Again, intake within these ranges is scored proportionately.

5. Component 10: Variety

The Food Pyramid stresses the importance of variety in diets. To measure this factor, the Healthy Eating Index counts the total number of *different* foods eaten by an individual that contribute substantially to meeting one or more of the five food group requirements. In practical terms, this means that foods are counted only if enough is eaten to contribute at least one-half of a serving to one of the five food groups discussed earlier.⁴ Foods that are very similar, such as different forms

³An exception is that soy products, which are usually used as meat substitutes, are always assigned to the meat group.

⁴Identical food items eaten on separate occasions were aggregated before imposing the one-half serving cutoff. For instance, if a person drank one third portion of milk at breakfast and another (continued...)

of potatoes or different forms of white bread, are grouped together and counted once in measuring variety. However, "mixtures" are broken down into their parts so that a single food item could contribute two or more points to the variety score. For example, beef stew could contribute as a meat and a vegetable. Technical details of how this coding is implemented are described in Section C below.

Once the total number of separate foods eaten is computed, the variety score is calculated in a manner analogous to the other index components. As discussed below, the current version of the index is based on three days of food intake data. Parameters developed on the basis of preliminary tabulations of the data are used to allot a person a maximum score of 10 points on the variety component if, over the three-day period covered by the available data, he or she eats substantial amounts (at least half servings) of 16 different foods. This score is then decreased proportionately to a score of zero for six foods.⁵

B. DATA USED TO CALCULATE THE INDEX

Estimates of American dietary patterns in relation to the Healthy Eating Index have been based on the 1989 and 1990 Continuing Survey of Food Intakes by Individuals (CSFII) databases. For most individuals in the database, 3 days of 24-hour dietary intake data are available, with first-day data collected during an in-person interview and second- and third-day data collected from food diaries. In addition to the dietary intake information, the CSFII databases contain extensive information about personal and socioeconomic characteristics, as well as knowledge of and attitudes toward healthy eating practices.

⁴(...continued)
one-third portion at supper, the milk would be counted toward the variety index, since the sum of the milk servings exceeded one half, even though each individual serving was less.

⁵This variety score clearly needs to have a different calibration if only one, rather than three, days of food intake data are used, since the number of different foods eaten in a day is substantially less than for three days. Based on data tabulations of one-day intakes conducted to date, it appears that the one-day parameter, which is roughly equivalent to the three-day parameters in the text, is to assign a maximum score for eating substantial amounts of 8 foods in a given day.

Persons in the databases constitute national probability samples of the U.S. population. Lower income groups were oversampled to increase precision levels in the analysis of these groups, but weights on the file make the sample representative of the U.S. population.

Most of the analysis of the Healthy Eating Index to date has focused on persons age 2 and older who are not pregnant or lactating. The unique nutritional needs and eating patterns of infants and of women who are pregnant or breastfeeding are not fully addressed by the Food Pyramid recommendations; thus we have excluded these individuals from the currant analysis. Also, the analysis has, for the most part, focused on individuals with a full three days of dietary data. These restrictions produce analysis samples of approximately 4,000 for the 1989 file and 3,500 for the 1990 file.

C. TECHNICAL DETAILS

Two closely related technical issues--the methods for determining portion sizes and the methods for allocating mixtures to individual food groups--are critical to the overall development of the index. Sections 1 and 2 below address these issues. Section 3 discusses another technical issue: how food group serving requirements by age and gender are estimated. Section 4 provides additional information about how variety is measured. Section 5 highlights a number of other design alternatives that were considered in developing the index.

1. Portion Sizes

The first five components of the index are based on recommended numbers of servings by food group. To compute the index, it is therefore necessary to determine the quantities of the various foods that will be counted as servings. This process is necessarily somewhat complicated.

The basic objective in setting serving sizes for the index calculations is to be as consistent as possible with the Food Pyramid booklet, which illustrates serving amounts for about 50 foods. For

instance, one slice of bread, one-half cup of cooked pasta, one whole medium apple, one cup of milk, and 2.5 ounces of lean meat are all described as single servings in the booklet.

However, the food consumption database used for calculating the index includes more than 4,000 different foods, as denoted by the 7-digit USDA coding system. It was therefore, necessary to develop procedures for generalizing from the serving size information in the Pyramid booklet in order to create serving size algorithms that are applicable to the full range of possible foods.

The basic approach used to develop conversion factors to convert quantities of food on the database measured in grams to numbers of servings is based on an existing database developed by MPR's subcontractor, Technical Assessment Systems (TAS), Inc.⁶ The TAS approach draws on a database maintained by TAS which breaks down each 7-digit USDA food into a set of 3-digit constituent commodity codes. For instance, bread made with flour, eggs, and milk is broken down into flour, eggs, and several constituents of milk, including nonfat milk solids and milk fat. Similarly, a fruit salad is broken down into its constituent fruits. The general approach to setting serving sizes for computing scores in the Healthy Diet Index is to create consistency across various foods in a food group by focusing on the amounts of key underlying commodities in these various foods.⁷ The following subsections provide highlights of how serving sizes are computed for each of the food groups. A complete description of the methods used in determining serving amounts is presented in Appendix A.

Grains. Serving amounts for breads and rolls are determined according to an "equivalent flour" approach. Based on an analysis of several breads, it was estimated that a typical slice of bread (which the Food Pyramid booklet designates as one serving) contains 15.2 grams of flour. Therefore, any other form of bread is converted to servings on the basis of the number of grams of flour it contains (according to the TAS database) divided by 15.2. For instance, if the TAS database indicates that

⁶See Appendix A.

⁷Because of limited resources, baby foods were not coded into food groups. Baby foods occur only infrequently in the sample of persons age two and older used in the analysis reported in the paper.

a certain kind of large roll has 30 grams of flour, that roll is counted as approximately two bread servings. The equivalent flour approach is a convenient way to estimate the extent to which many different kinds of bread made with different proportions of nongrain ingredients contribute to the grains food group.

Serving amounts for pasta are similarly determined. The Food Pyramid states that one-half cup of cooked pasta constitutes one serving. This amount is estimated to contain 25 grams of flour, and this numerical factor is used to convert all types of pasta to serving amounts.

Grain servings in ready-to-eat cereals are treated in a similar way. Serving calculations are based on an assumption that the standard serving size specified in the Food Pyramid for these products, one ounce, contains 28 grams of the underlying cereal commodities.

Vegetables. The Food Pyramid specifies that one-half cup of most cooked vegetables, 1 cup of most raw leafy vegetables, and one-half cup of most raw nonleafy chopped vegetables should each be counted as a single serving. Different vegetables have different densities, however, and therefore have different weights in grams for a cup or half-cup measure. Therefore, different gram/serving size factors are used to calculate the index for most vegetables on the basis of information about the weight of a cup (or one-half cup) of the relevant commodities. For instance, one-half cup of cooked corn weighs 85 grams, 77 grams of which are corn. Therefore, to estimate serving amounts, the number of grams of corn a person eats is divided by 77. Similarly one serving of broccoli is 44 grams; a serving of carrots is 60 grams.

Fruits. Fruits are treated like vegetables. For most fruits, the Food Pyramid specifies that one-half cup of raw or canned fruit or three-quarters cup of fruit juice is a serving, and gram/serving size conversion factors for each fruit have been developed according to the weights of these amounts of the various fruits.

Dairy. The Food Pyramid booklet defines one cup of milk as one serving. One cup of milk contains 9.93 grams of nonfat milk solids. Therefore, for various kinds of milk and milk products,

serving amounts are calculated on the basis of the grams of nonfat milk solids contained in the food divided by 9.93. This procedure provides a consistent approach to dealing with the fact that milk comes in many different forms, such as dry, diluted, condensed, etc., which vary in their gram equivalency to eight ounces of milk.

The portion sizes for cheeses are estimated by adding up the total weight of all milk products in the cheese (nonfat milk solids, milk fat solids, lactose, and milk-based water) and dividing the sum by standard portion amounts which are 43 grams for natural cheese and 57 grams for processed cheese, based on Food Pyramid recommendations. Although this procedure typically implies counting the entire weight of the cheese, there are exceptions when other products (e.g., wine or olives) have been added to the cheese. In these cases, only the milk-based components count toward the dairy group (though the added commodities could count toward other food groups).

Meats and Meat Substitutes. Serving sizes of meats are specified in the Food Pyramid booklet in terms of ounces of lean meat. The TAS database breaks down various types and cuts of meat into "fat-free meat" commodity codes and "fat." Serving size factors for meats are based on the amount of the TAS fat-free meat commodity in various foods. For instance, the TAS database shows that 1 ounce of a lean cut of beef such as that referred to in the Food Pyramid booklet includes 25.5 grams of fat-free meat (since even "lean" beef contains some fat). Therefore, to estimate the number of ounces of lean beef in a given cut of beef. The ounces of fat-free meat in the TAS commodity database for that cut is divided by 25.5. This numerical conversion factor varies somewhat from one meat to another, depending on how fatty "lean" cuts of meat are.

Conversion factors for converting grams of nuts and peanut butter to serving sizes are based directly on the Food Pyramid booklet, which indicates that one-third cup of nuts or two tablespoons of peanut butter constitute a serving. The gram conversion factors are based on the weight of these quantities.

The Food Pyramid booklet discusses meat portions largely in terms of ounces. However, there is inconsistent information as to exactly how many ounces between 2 and 3 are to count as a serving. The index calculations assume that 2.5 ounces of meat are a serving.

2. Dealing with "Mixtures" in Computing Group Scores

In calculating the Healthy Diet Index, it is necessary to have a way of assigning the foods in mixtures, such as pizza or stew, to their constituent food groups in the appropriate amounts. Pizza, for instance, may make significant contributions to several different food groups, including grains, vegetables, dairy, and meat.

The approach used to allocate mixtures to food groups is a straightforward extension of the approach for estimating portion sizes. For each relevant 7-digit USDA food, the TAS database is used to determine the underlying commodities in the food. These commodities are then assigned to the relevant food groups according to the serving size algorithms described in the previous section. For example, part of a pizza is assigned to the bread group according to the weight of the flour in the crust, part is assigned to the vegetable group according to the weight of the tomato sauce, and part is assigned to the dairy group according to the weight of the four milk commodities in the cheese. Any meat on the pizza is assigned to the meat group, using the "fat-free" commodity code weights. Analogous procedures are used for other mixtures.

3. Calculating Serving Requirements by Age and Gender

To implement the scoring of the first five components of the index, it is necessary to determine required numbers of servings by food group for each individual on the data file. As shown in Table 1, the Food Pyramid booklet provides serving recommendations for 3 levels of food energy intake corresponding to 1600, 2200, and 2800 calories.

TABLE 1
RECOMMENDED NUMBERS OF SERVINGS PER DAY AT FOOD ENERGY LEVELS
DISCUSSED IN THE FOOD PYRAMID BOOKLET

Kilocalories	Grains	Vegetables	Fruits	Dairy	Meat
1600	6	3	2	2 ^a	2
2200	9	4	3	2 ^a	2.4
2800	11	5	4	2 ^a	2.8

^aThree servings are recommended for ages 11 through 24, or for pregnant or breastfeeding women.

However, the food energy RDA for many age/gender combinations are different from the three shown in the table. For instance, recommended food energy is only 1300 kilocalories for children between 1 and 3 years old, it is 1900 for females older than 50 years old, and it ranges as high as 3000 for males 15 to 18 years old. Extrapolation and interpolation techniques were therefore used to estimate required numbers of servings for the various food groups for age/gender combinations not covered by the three examples in the Food Pyramid booklet.

For each food group, a least squares regression line was calculated. This predicts recommended food servings as a function of recommended energy requirements. Each of these regression lines is based on the three data points available from the Food Pyramid literature: 1600, 2200, and 2800 kilocalories. The regression lines are then used to estimate required numbers of servings for individuals with other food energy RDA levels. The results are shown in Table 2.

This approach is complicated by the fact that one of the groups of individuals of interest to the study, children of ages 2 to 3, has an RDA for food energy that is below the lowest point in the table in the Food Pyramid booklet, and this lowest point is associated with the minimum recommended serving amounts. Thus, implicit in a simple extrapolation for this group is the need to use, for the index calculations, numbers of servings that are smaller than the minimum shown in the Food Pyramid. However, extrapolating to smaller numbers of servings would be inconsistent with the Food Pyramid booklet, which states:

TABLE 2
RECOMMENDED NUMBER OF SERVINGS PER DAY
AT ADDITIONAL FOOD ENERGY LEVELS

Age/Gender Category	Kilocalorie RDA	Grains	Vegetables	Fruits	Dairy	Meats
Children 2-3	1300	6 ^a	3 ^a	2 ^a	2 ^a	2 ^a
•	1600	6	3	2	2	2
Children 4-6	1800	7	3.3	2.3	2	2.1
Females 51+	1900	7.4	3.5	2.5	2	2.2
Children 7-10	2000	7.8	3.7	2.7	2	2.3
• Female 11-50 ^c	2200	9	4	3	2 ^b	2.4
Males 51+	2300	9.1	4.2	3.2	2	2.5
Males 11-14	2500	9.9	4.5	3.5	3	2.6
•	2800	11	5	4	2	2.8
Males 19-50	2900	11	5	4	2 ^b	2.8
Males 15-18	3000	11	5	4	3	2.8

^aPortion sizes are reduced for children 1-3.

^bThe dairy serving level is 3 for persons 11 to 24.

^cNot pregnant or lactating.

* RDA levels included in the Food Pyramid book.

Preschool children need the same variety of foods as older family members do, but may need less than 1,600 calories. For fewer calories, they can eat smaller servings.

Therefore, when the index values for this age group are calculated, the *number* of servings was held constant at the minimums shown in the pyramid, but the *serving sizes* (as discussed in Section 1 above) were reduced proportionately according to the amounts for which the regression lines indicate that the number of servings would fall below the minimum.

There is a similar issue at the high end of the RDA distribution, where males age 15 to 50 have calorie RDAs slightly higher than the high point shown in the table in the Food Pyramid booklet. In this case, the Food Pyramid booklet does not explain how to deal with the issue, and so food portions at the maximums in the Food Pyramid booklet are truncated without adjusting serving sizes. (None of the results obtained from the index would be significantly affected by using the alternative convention of raising portion sizes slightly.)

4. Measuring Variety by Grouping Foods for the Variety Component of the Index

The USDA coding structure, which forms the basis of the food coding used to compute the Healthy Eating Index, involves a very fine level of coding detail. More than 4000 food codes are used on the 1989 and 1990 CSFII data files, and many of the separate items in this coding structure are very similar. For instance, white bread and rolls made from white flour are two separate codes. Similarly, several different forms of white potatoes have different codes, as do whole milk and 2 percent milk. Many different cuts of beef also each have their own codes.

The measure of variety for the index was derived by grouping foods that were very similar together. A team of nutritionists aggregated the more than 4,000 food codes on the two files into a substantially reduced number of approximately 350 discrete food codes. Although this coding method is somewhat subjective, the following general principles guided the work:

- Foods judged to be nutritionally similar except for fat are grouped together.

- Foods made with separate commodities (i.e., derived from different animals or different plants) are grouped separately.
- Foods made from the same commodities but with substantially different form are grouped separately. For instance, orange juice is grouped separately from whole oranges, which contain much more fiber.
- In general, foods that differed only in fat content are grouped together. For instance, green beans with butter and green beans without butter are grouped together.

The following illustrate the types of coding decisions that were made:

- Each kind of vegetable (e.g., tomatoes, lettuce, broccoli) was given a different code. However, in general, all forms of the same vegetable were coded together.
- In general, different forms of the same meat (e.g., beef, pork, chicken) were coded together. Some exceptions were made, however. For instance organ meats were coded separately, and ham was coded separately from pork.
- Each type of fish was given a different code, but different forms of the same fish received the same code.
- Most forms of fluid milk were given the same code, and that same code was assigned to ice cream. However pudding has a different code reflecting the importance of grains in pudding.
- Most cheeses have the same code, but cottage cheese has a different code.
- In general, all white bread made from wheat, including bagels and pita bread, received the same code. However, sweet rolls were given a different code and pasta received a different code.
- Whole wheat products were coded differently from products made with refined wheat flour.
- Ready-to-eat cereals made principally from the same grain received the same codes; those from different grains received different codes.

Complete information on the groupings is included in Appendix C.

Assessing variety also requires breaking down mixtures into their constituents. To make this possible, mixtures are broken down into their component food codes before the variety index is

calculated.⁸ For instance, a lasagna may contribute significant amounts of pasta and meat and should thus be counted as yielding two "points" to the variety score (unless, of course, the person has already eaten one or both of these foods at different times during the observation period).

5. Alternatives Considered and Rejected

A review of two alternatives that were considered, but not used, in constructing the index can provide additional insight into the structure of the index and how it is interpreted.

Whether to Count Small Amounts of Contributions to Food Groups. Many foods clearly fall principally within one food group but contain some amounts of other foods. For instance, bread is mainly a grain food, but it may contain small amounts of dairy and egg (meat) products. The issue

⁸In order to make the task of disaggregating foods manageable within the available time and resources, only component foods which were present in mixtures in substantial quantities were included in the variety calculations. The following procedures were used in implementing this: for each potential mixture, the common measure or weight of the edible portion was obtained from the *USDA Food Code Manual for Individual Intake* (1) and from *Bowes & Church's Food Values of Portions Commonly Used* (2). From these sources it was determined which components of the food, if any, would be present in a usual serving in an amount equal to at least one half portion size. (Note that the portion sizes derived from these sources may in some instances deviate from those used in computing the first five components of the index. The coding work described in this footnote required ascertaining the portion size of the *overall mixed dish*, whereas the earlier discussion focus was on only the portion sizes of the *constituents* of the mixed dish.) Only those components which met the one half portion size under this minimum size threshold were decomposed from the mixtures into the variety calculations. As an example, consider the code for a "Big Mac." The commonly used convention of a standard serving (i.e., one Big Mac sandwich) weighs 224 grams. This amount of a Big Mac yields approximately 3.0 servings of bread, 1 serving of beef, .5 servings of cheese, and .3 servings each of ketchup and lettuce, where these component servings are measured in terms of the Food Pyramid booklet recommendations described in an earlier section. Therefore, in computing the variety score, the bread, meat and cheese were taken into account, but the vegetables were ignored, since they yield less than one-half of a Food Pyramid serving. This convention has the potential for slightly decreasing some people's variety scores. In the above example, for instance, if the person had similar vegetables at another eating occasion, the sum of the vegetable amounts might have exceeded the one-half serving threshold, even though the vegetables on the Big Mac did not do so by themselves. However, we believe that the effects on the final results are extremely small, and use of the convention greatly facilitated coding, since it eliminated the need to undertake the food decomposition for many foods which contained only small amounts of a second component (e.g., the grain component in chicken with breading). A second simplifying convention that was used is that in instances where a single food contained two or more components from the same food group (e.g., a vegetable mixture), it was assumed that the entire amount of food from that food group could be reasonably allocated equally to the food group codes which were present in the mixture in the highest proportions.

here is whether, in computing scores on the first five components of the HEI to track bread *solely* into the grain group or to recognize its contributions to other food groups as well. The former choice would be supportable in terms of the Food Pyramid booklet, where the examples of foods given are, in general, assumed to be in only one group. Furthermore, once a cutoff level was established, it would be relatively easy to implement. However, it was decided that all contributions to various food groups would be counted, without imposing a minimum size cutoff. This decision was made on two grounds. First, even relatively small amounts of incidental foods contribute to an individual's overall nutritional status. Second, disregarding the "incidental" foods would have involved often arbitrary judgments as to how to draw the cutoff line for what is incidental. There appears to be no clear place to draw the line between foods like bread, which are mainly in one food group, and true "mixtures" like lasagna, which contribute substantially to several food groups.

This decision has a number of implications. First, the nutrition value from condiments, such as ketchup, is counted in the index, though the small amounts of condiments used usually make them unimportant to the overall index value that is computed. Secondly, the nutrition value of the milk in some sweets, such as a milk chocolate bar, is counted in the dairy group when computing the index even though the overall food would, if allocated to one group, be allocated to the "sweets" group, which is not counted in the index. Similarly, the fruit juice in a soft drink that is 10 percent fruit juice or the potato content of potato chips are both counted in computing the index, though the water and sugar in the soft drink and the fat content of the potato chips are not counted, when computing the first five components of the index.⁹

Whether to Include a Component Reflecting the Intake of Food Energy. Obesity is a significant public health problem in the United States, and one focus during the early development work for the index was whether to include a component that would be related to food energy consumption. Two

⁹The fat content of potato chips is, of course, counted in computing the components of the index pertaining to fat.

possibilities were considered: (1) measures of appropriate body weight, such as a body mass index score or conformance to standard weight-for-height tables; and (2) a measure of food energy intake in relation to the relevant RDA.

It was decided that neither approach was satisfactory, and no component of this type was included in the index. The physical indicators were rejected on the grounds that they were not direct measures of diets and were significantly influenced by other factors, such as levels of physical activity, unrelated to current eating patterns. Therefore, a component based on these measures would not have been parallel to the other parts of the index. A measure based on food energy in relation to the RDA was dropped from consideration because it was found, during preliminary tabulations of the data, not to be highly correlated with physical measures of obesity.

D. TABULATIONS OF THE INDEX

This section presents preliminary tabulations conducted with the index. All tabulations include only CSFII sample observations for whom three days of data were available. Tabulations are based on three days of intake data and are weighted to represent the overall U.S. population.

1. Average Overall Scores

The average score on the Healthy Eating Index for the 1989 CSFII was 63.9 (Table 3). Approximately 10 percent of persons scored above 80, while 13 percent scored below 50. The remaining observations are quite evenly distributed among the different categories in the range of 51 through 80.

The values of the index are quite similar for the 1989 and 1990 data sets. Because the few differences are small, it is possible that they are a result of statistical sampling error.

2. Component Scores

There is significant variation in average scores among the components of the index (Table 4). The lowest mean score is for fruits, for which the average is 4.0. Scores are also relatively low for

TABLE 3
PERSONS BY INDEX LEVEL

Level of Index	1989	1990
< 30	a	a
30 - 39	2 %	3 %
40 - 49	11 %	12 %
50 - 59	26 %	23 %
60 - 69	28 %	29 %
70 - 79	22 %	21 %
80 - 89	10 %	10 %
≥ 90	1 %	2 %
Mean	63.9	64.0
Sample Size	3,997	3,466

SOURCE: Data from Continuing Survey of Food Intake by Individuals, U.S. Department of Agriculture, 1989 and 1990 weighted data; ages 2+; 3-day data.

^aLess than .5 percent.

TABLE 4
LEVELS OF INDEX COMPONENTS^a

	Mean	Percent Observations at Score = 0	Percent Observations at Score = 10
Grains	6.2	.1 ^a	11.1
Vegetables	6.1	.8	17.1
Fruits	4.0	13.2	13.6
Dairy	6.7	.2	32.5
Meat ^a	7.5	.1	32.2
Total Fat	6.3	5.0	20.3
Saturated Fat	5.1	18.7	19.5
Cholesterol	8.0	10.8	69.1
Sodium	7.0	9.6	36.2
Variety	7.0	2.8	32.9
Total ^b	63.9	--	--
Sample Size	7,463	7,463	7,463

SOURCE: Data from Continuing Survey of Food Intake by Individuals, U.S. Department of Agriculture, pooled 1989 and 1990 weighted data; ages 2+; 3-day data.

^aIncludes eggs, nuts, and some legumes.

^bComponents may not add to total due to rounding.

the vegetables and the saturated fat component. Scores are relatively high for the cholesterol and meat components.

3. Correlation with RDAs Attained

An important criterion for assessing the Healthy Eating Index is to examine the degree to which it is correlated with other conventional measures of diet. As shown in the first five columns of Table 5, for most nutrients, the likelihood of people meeting at least 75 percent of their RDAs¹⁰ rises substantially with higher index scores. For example, among individuals scoring less than 50 on the index, only 47 percent attain 75 percent of their RDA of Vitamin C (Table 5, Row 6). However, this percentage rises to about 91 percent for individuals scoring between 70 and 79 on the index and to nearly 99 percent for those scoring 80 or above. Similar relationships are observed for most of the nutrients in the table.

The statistical relationship between the index and nutrient intake levels is also confirmed by the correlation coefficients presented in the last column of the table. For each of the nutrients, there is a positive association between the index and intake of the nutrient, and these correlations range up to the range of .40 to .42 for magnesium, vitamin C, vitamin B6, and folate.

4. Differences by Person and Household Characteristics

There is a modest amount of variation in index scores by person and household characteristics (Table 6). Key patterns included the following. Females tend to score higher than males. The difference in means is more than 3 points. When the index is cross-tabulated with age, there is a bimodal pattern. The young and the old tend to score above the mean, while persons in the 15- to 39-year-old bracket have the lowest scores. Persons in households with a single male head tend to score substantially lower on the index than do persons in households with a single female head or in

¹⁰75 percent of the RDA is chosen as a criterion because the RDA are set in such that they are higher than most people need. Index tabulations have also been performed using a 100 percent criterion, and the results are essentially the same as those reported in the text for 75 percent.

TABLE 5
PERCENT OBSERVATIONS MEETING 75 PERCENT OF RDA BY INDEX LEVELS

Nutrient	Index Score					Correlation Coefficient of Index with Consumption
	0-49	50-59	60-69	70-79	≥ 80	
Food Energy	33.4	47.2	50.8	57.1	66.1	.21
Protein	81.5	90.8	94.6	98.0	99.6	.20
Vitamin A - IU	35.4	54.2	66.4	82.3	91.8	.31
Vitamin A - RE	32.4	51.2	61.7	76.6	88.7	.29
Vitamin E	32.3	45.0	47.0	49.2	61.7	.15
Vitamin C	47.0	65.6	81.6	90.7	98.6	.42
Thiamin	60.8	80.9	90.7	96.2	98.4	.35
Riboflavin	69.5	81.8	85.4	93.3	97.7	.27
Niacin	70.5	86.0	94.0	97.4	99.1	.33
Vitamin B6	32.4	52.7	65.7	84.0	94.0	.40
Folate	54.9	75.0	85.2	94.5	98.9	.40
Vitamin B12	85.5	93.0	93.6	95.4	97.9	.06
Calcium	38.6	50.2	52.9	63.8	72.1	.15
Phosphorous	71.9	83.8	90.1	95.6	98.6	.14
Magnesium	29.0	46.0	55.9	71.9	89.5	.40
Iron	54.5	66.6	75.5	84.2	90.0	.21
Zinc	39.6	47.3	45.7	52.6	53.8	.06
Sample Size						7,463

SOURCE: Data from Continuing Survey of Food Intake by Individuals, U.S. Department of Agriculture, pooled 1989 and 1990 weighted data; ages 2+; 3-day data.

TABLE 6
MEAN INDEX SCORES BY HOUSEHOLD CHARACTERISTICS

Sex	
Male	62.3
Female	65.5
Age	
2 - 4	71.0
5 - 14	66.3
15 - 39	60.4
40 - 64	63.9
65 +	69.1
Head of Household	
Male and Female	64.1
Female	64.8
Male	59.4
Education Level	
< 2 years high school	60.3
2-3 years high school	60.2
4 years high school	61.7
Some college	64.5
4 years college	66.1
> 4 years college	68.2
Percent Poverty Level	
0-50%	60.8
51-100%	60.6
101-130%	63.0
131-200%	62.0
201-300%	63.7
301% +	65.3
Sample Size	7,463

SOURCE: Data from Continuing Survey of Food Intake by Individuals, U.S. Department of Agriculture, pooled 1989 and 1990 weighted data; ages 2+; 3-day data.

which there are two heads. Index scores for persons in households below the poverty level are substantially lower than the national mean.

REFERENCES

- Guthrie, Helen Al., and James C. Scheer. "Validity of a Dietary Score for Assessing Nutrient Adequacy." *Journal of the American Dietetic Association*, vol. 78, March 1981.
- Patterson, Ruth E., Pamela S. Haines, and Barry M. Popkin. "Diet Quality Index: Capturing a Multidimensional Behavior." *Journal of the American Dietetic Association*, January 1994.
- Pennington, J.A.T. *Bowes & Church's Food Values of Portions Commonly Used*. Sixteenth Edition. J.B. Lippincott Co., Philadelphia, 1994.
- U.S. Department of Agriculture and U.S. Department of Health and Human Services. *Nutrition and Your Health: Dietary Guidelines for Americans*. Third Edition, 1990. (USDA Home and Garden Bulletin 232.)
- USDA Human Nutrition Information Service. Food Code Manual for Individual Intake, Continuing Survey of Food Intakes by Individuals, 1991.
- U.S. Department of Agriculture, Human Nutrition Information Service. *The Food Guide Pyramid*, 1992. (USDA Home and Garden Bulletin 252.)

APPENDIX A

CODING FOODS INTO FOOD PORTIONS BY FOOD GROUP

The calculation of the Healthy Eating Index required developing a coding structure which translates 100-gram quantities of the foods represented by the 7-digit USDA food codes into equivalent serving amounts by food group. For some foods, this translation is from a specific food to a single food group. For instance, the code for whole milk is translated only into dairy group servings. In other instances, the food codes are translated into portion amounts of more than one food group. For instance, depending on the type of lasagna, 100 grams of lasagna might be translated into fractional portions of several groups, including grains, dairy, meat, and vegetables.

Section C.1 of the text of the report provides an overview of the approach and guidelines used to perform this coding. This appendix provides additional details. The coding notes reproduced below are organized by food group and within each food group provide information indicating the portion size assumptions that were used for various types of foods. These notes, when examined in conjunction with the Section C.1 material cited above, provide full information on how most basic foods were coded. Further details on the coding can be obtained from examining the actual data file containing the coding results. This is available on request from Mathematica Policy Research.

APPENDIX A
CODING FOODS INTO PORTIONS
BY FOOD GROUP

MILK AND MILK PRODUCTS

*One serving = the number of grams of MILK, NONFAT SOLIDS in 8 fluid ounces of fluid lowfat milk (9.93g).

Commodities for milk products include:

milk nonfat solids
milk fat solids
milk sugar (lactose)
milk-based water

Food code ranges include general categories of foods mapped to the same serving size. Mixtures are not listed here, but components of the mixture such as beef in a casserole were assigned the same serving size as that same component eaten separately.

1. FLUID MILK 8 fl OZ: 9.93g of MILK NONFAT SOLIDS

Food Code range: 1110000-1112200, 1151100-1156101,
1161100-1165101

2. FLUID MILK EVAPORATED: 9.93g of MILK NONFAT SOLIDS

Food Code range: 1121000-1121320

3. FLUID MILK CONDENSED: 9.93g of MILK NONFAT SOLIDS

Food Code range: 1122000-1122020

4. FLUID MILK IMITATION: 9.93g of MILK NONFAT SOLIDS

Food Code range: 1131000-1134000

5. MILK AS AN INGREDIENT: 9.93g of MILK NONFAT SOLIDS

6. CREAM, SOUR CREAM: 9.93 g of MILK NONFAT SOLIDS

Food Code range: 1210010-1235010

7. YOGURT 8 fluid OZ: 9.93g of MILK NONFAT SOLIDS

Food Code range: 1141000-1144500

MILK AND MILK PRODUCTS (cont'd)

8. DRY MILK, NOT RECONSTITUTED: 9.93g of MILK NONFAT SOLIDS
Food Code range: 1181000-1194010
9. MILK DESSERTS: 9.93g of MILK NONFAT SOLIDS
Food Code range: 1146000-1146126, 1311000-1325220
10. NATURAL CHEESE 1-1/2OZ: Pyramid serving = 43g of sum of milk commodities
Food Code range: 1410010-1413300
11. PROCESSED CHEESE 2OZ: Pyramid serving = 57g of SUM of milk commodities
Food Code range: 1441010-1442040
12. CHEESE AS INGREDIENT: Serving = 57 g of sum of milk commodities
13. COTTAGE CHEESE: 9.93g of MILK NONFAT SOLIDS
Food Code range: 1420010-1422000
14. CREAM CHEESE:
Food Code range: 1430101-1430301
15. IMITATION CHEESE: Serving = 57g of sum of milk components
Food Code range: 1450101-1450401

MEAT, POULTRY, FISH, DRY BEANS, EGGS, AND NUTS GROUP

[1 ounce meat or meat equivalent]

1. BEEF 1 OZ: ounce equiv = 25.5g lean
Food Code range: 2000000-2160300

Commodities include:

Beef (boneless) fat
Beef (boneless) lean (fat-free)
Beef-dried
Beef-by-product

MEAT, POULTRY, FISH, DRY BEANS, EGGS, AND NUTS GROUP (cont'd)

2. PORK 1 oz: ounce equiv = 24.7g lean

Food Code range: 2200010-2250101, 2270100-2270911

Commodities include:

Pork (boneless) fat
Pork (boneless) lean (fat-free)
Pork-by-product

3. LAMB 1 OZ: ounce equiv = 25.5g lean

Food Code range: 2300010-2313200

Commodities include:

Sheep (boneless) fat
Sheep (boneless) lean (fat-free)
Sheep-by-product

4. GOAT 1 OZ: ounce equiv = 25.5g lean

Food Code range: 2315010-2315030

Commodities include:

Goat (boneless) fat
Goat (boneless) lean (fat-free)
Goat-by-product

5. POULTRY 1 oz: ounce equiv = 27g lean

Food Code range: 2410000-2440410

Commodities include:

Chicken (boneless) fat
Chicken (boneless) lean (fat-free)
Poultry (other) lean
Poultry (other) fat
Turkey (boneless) fat
Turkey (boneless) lean (fat-free)
Turkey-unspecified
Turkey-by-products

MEAT, POULTRY, FISH, DRY BEANS, EGGS, AND NUTS GROUP (cont'd)

6. VEAL 1 OZ: ounce equiv = 26.4g lean

Food Code range: 2320010-2322003

Commodities include:

Veal (boneless) fat
Veal (boneless) lean (fat-free)
Veal-dried
Veal-by-product

7. GAME 1 OZ: ounce equiv = 28 g lean

Food Code range: 2331000-2334510

Commodities include:

Meat-game

8. ORGAN MEATS: ounce equiv = 28g

Food Code range: 2510010-2517051

Commodities include:

Beef organ meats-liver
Beef organ meats-kidney
Beef organ meats-other
Goat organ meats-liver
Goat organ meats-kidney
Goat organ meats-other
Pork organ meats-liver
Pork organ meats-kidney
Pork organ meats-other
Sheep organ meats-liver
Sheep organ meats-kidney
Sheep organ meats-other
Veal organ meats-liver
Veal organ meats-kidney
Veal organ meats-other
Chicken giblets (exclude liver)
Chicken giblets (liver)
Poultry giblets (liver)
Turkey giblets (liver)
Turkey organ meats (other)

MEAT, POULTRY, FISH, DRY BEANS, EGGS, AND NUTS GROUP (cont'd)

9. FINFISH 1 oz: ounce equiv = 28g

Food Code range: 2610010-2615716

Commodities include:

Fish-unspecified
Fish-freshwater finfish
Fish-saltwater finfish
Fish-finfish-saltwater-dried
Fish-tuna

10. SHELLFISH 1 oz: ounce equiv = 28g

Food Code range: 2620311-2632116

Commodities include:

Fish-Roe/Caviar
Fish-shellfish

11. EGGS (one ounce equiv.): 50g

Food Code range: 3110101-3111101

Commodities include:

Eggs-white only
Eggs-yolk only
Eggs-whole

12. SOY BEANS (one ounce equiv): 57g

Food Code range: 4110700, 4142001-4142020

Commodities include:

Soybeans-flour (defatted)
Soybeans-flour (full fat)
Soybeans-flour (low fat)
Soybeans-mature seeds-dry
Soybeans-unspecified

MEAT, POULTRY, FISH, DRY BEANS, EGGS, AND NUTS GROUP (cont'd)

13. NUTS 1/3 CUP (one ounce equiv): 47g

Food Code range: 4210010-4211610

Commodities include:

Almonds
Beechnuts
Brazil nuts
Butter nuts
Cashews
Chestnuts
Filberts (hazelnuts)
Hickory nuts
Macadamia nuts (bush nuts)
Pecans
Walnuts
Lychees
Peanuts
Pinenuts
Pistachio nuts

14. SEEDS 1/4 CUP (one ounce equiv): 32g

Food Code range: 4310010-4310305

Commodities include:

Seeds (pumpkin, etc.)
Sesame seeds
Sunflower seeds-with hulls
Sunflower seeds-hulled

15. PEANUT BUTTER 2 TBSPS (one ounce equiv): 32g

Food Code range: 4220050-4220400

Commodities include:

Peanut butter

BREAD, CEREAL, RICE AND PASTA GROUP

1. BREAD AND ROLLS - Serving size 1 slice (25g): Flour (grain) equivalent = 15.2g

Food Code range: 5100010 - 5180700

Grain commodities include:

Barley
Buckwheat
Corn grain-bran
Corn grain-endosperm
Millet
Oats
Oats-bran
Rice-milled
Rice-rough
Rice-bran
Rye-flour
Rye-germ
Rye-rough
Wheat-bran
Wheat-germ
Wheat-rough
Wheat-flour

2. QUICK BREAD (use flour equivalents as with breads)

Food Code range: 5210100-5240800

Grain commodities as for BREADS AND ROLLS.

3. COOKED CEREAL - Pyramid serving size is 1/2 cup (117g): 18g

Food Code range: 5620030-5620354, 5620700-5621000

117 g of cooked cereal Food Codes = 1 serving. This translates to 18g of grain.

Grain commodities include:

Barley
Buckwheat
Corn grain-bran
Corn grain-endosperm
Millet
Oats
Oats-bran
Rice-milled
Rice-rough
Rice-bran
Rye-flour

BREAD, CEREAL, RICE AND PASTA GROUP (cont'd)

Rye-germ
Rye-rough
Wheat-bran
Wheat-germ
Wheat-rough
Wheat-flour

4. RTE CEREAL - Pyramid serving size of all RTE cereals is 1 oz. In order to adjust for cereals with components other than grain use 28g of grain = 1 serving.

Food Code range: 5700000-5741800

Grain commodities include:

Barley
Buckwheat
Corn grain-bran
Corn grain-endosperm
Millet
Oats
Oats-bran
Rice-milled
Rice-rough
Rice-bran
Rye-flour
Rye-germ
Rye-rough
Wheat-bran
Wheat-germ
Wheat-rough
Wheat-flour

5. PASTA - Pyramid serving size of cooked pasta is 1/2 cup (75 g): 23g

Food Code range: 5610100-5614000

Grain commodities include:

Corn grain-bran
Corn grain-endosperm
Wheat flour

BREAD, CEREAL, RICE AND PASTA GROUP (cont'd)

6. RICE - Pyramid serving of cooked rice is 1/2 cup (102g): 38g
Code Food Code range: 5620500-5620601
Grain commodities include:
Rice-rough
Rice-milled
Rice-bran
Wild rice
7. CAKES: use flour equivalents 15.2g
Food Code range: 5210005-5312412
8. COOKIES: use flour equivalents 15.2g
Food Code range: 5320010-5327010
9. PASTRIES: use flour equivalents 15.2g
Food Code range: 5340020-5361025
10. PIES: use flour equivalents 15.2g
Food Code range: 5330010-5339120
11. CRACKERS: use flour equivalents 15.2g
Food Code range: 5410100-5433900
12. SNACKS: use flour equivalents 15.2g
Food Code range: 5440101-5444001
13. OTHER: use flour equivalents 15.2g
Food Code range: 5510100-5580100
14. OATS, OTHER GRAINS: 18g
15. RICE: 38g
16. WHEAT FLOUR (breading): 15.2g
17. WHEAT FLOUR (pasta): 23g
[Individual codes identified by keyword searches]

VEGETABLES GROUP

Serving sizes based on weight of raw. (1/2 cup cooked weight includes water used in processing, so only a percent of the cooked weight is actually the vegetable.)

1. DARK GREEN LEAFY VEG. Pyramid serving size is 1 cup: 40g

Food Code range: 7210110-7213320

Commodities include:

Beet greens
Radish tops
Sweet potato leaves
Taro greens
Turnip greens
Spinach
Swiss chard
Endive and escarole
Cress
Garden
Cress-upland
Dandelion greens
Parsley

2. BROCCOLI: 44G

Food Code range: 7220110-7220203

Commodities include:

Broccoli

3. CARROTS: 60G

Food Code range: 7310101-7310302

Commodities include:

Carrots

4. OTHER DEEP YELLOW VEG: 1/2 cup COOKED: 120g

Food Code range: 7320100-7342100

Commodities include:

Pumpkin
Winter squash
Sweet potatoes

VEGETABLES GROUP (cont'd)

5. DRY BEANS 1/2 cup cooked = 90g, equiv to 36g dry weight: 36g

Food Code range: 4110100-4110900

Commodities include:

Beans, dry
Blackeye peas (beans), dry
Cowpeas (beans), dry
Broadbeans, dry
Dry garbanzo beans, dry
Chick peas (beans), dry
Great northern beans, dry
Hyacinth beans, dry
Kidney beans, dry
Lima beans, dry
Navy beans, dry
Other beans, dry
Pigeon peas (beans), dry
Pinto beans, dry

6. DRY PEAS: 1/2 cup cooked = 98g, equiv to 40g dry: 40g

Food Code range: 4130100-4130500

Commodities include:

Peas, garden, dry
Lentils, split, dry
Lentils, whole, dry

7. LIMAS AND OTHER SUCCULENT LEGUMES : 93g

Food Code range: 7520400-7520602

Commodities include:

Succulent broadbeans
Succulent hyacinth
Succulent limas
Succulent, other legumes

8. POTATO: 77G

Food Code range: 7100010-7150805

Commodities include:

Potatoes, white, peel only
Potatoes, white, peeled
Potatoes, white, unspecified
Potatoes, white, whole

VEGETABLES GROUP (cont'd)

9. CORN: 77G

Food Code range: 7521600-7521632

Commodities include:

Corn, sweet

10. GREEN PEAS: 73G

Food Code range: 7522401-7522413

Commodities include:

Peas, garden, green

11. OTHER STARCHY VEGETABLES (hominy; roots and tubers), COOKED : 70G

Food Code range: 7190010-7198020, 7510075, 7510250, 7512500,
7512700, 7520100-7520102, 7520800-7520812, 7520950, 7521362,
7521749-7521771, 7522200-7522202, 7522710-7522901, 7523400-7523402

Commodities include:

Jerusalem artichokes
Beets-roots
Burdock
Cassava
Corn grain-endosperm--hominy
Horseradish
Parsnips
Radishes, roots
Radishes, japanese
Rutabaga
Salsify
Taro-root
Taro-dried
Turnips-roots
Yambean tuber
Globe artichokes
Bread fruit

12. DRY POTATO: 11.8G

Commodities include:

Potatoes (white)-dry

VEGETABLES GROUP (cont'd)

13. RAW LEAFY: 55G

Food Code range: 7511300-7511400

Commodities include:

Lettuce-head varieties
Lettuce, leafy varieties
Lettuce, unspecified
Leafy oriental veggies

14. RAW TOMATOES: 120g

Food Code range: 7410100-7410200

Commodities include:

Tomatoes-whole

15. TOMATO SAUCE: 120g

Food Code range: 7440201-7440305

Commodities include:

Tomatoes-puree

16. TOMATO PASTE: 120g

Food Code range: 7440311

Commodities include:

Tomatoes-paste

17. TOMATO CATSUP: 120g

Food Code range: 7440101-7440111

Commodities include:

Tomatoes-catsup

18. TOMATO PUREE: 120g

Food Code range: 7440312

Commodities include:

Tomatoes-puree

VEGETABLES GROUP (cont'd)

19. OTHER RAW VEGETABLES: 60g

Food Code range: all in 7510025-7523650 not included in other categories

Commodities include:

Alfalfa sprouts
Artichokes-globe
Asparagus
Bamboo shoots
Beans-succulent-green
Beans-succulent-yellow/wax
Brussels sprouts
Cabbage-chinese/celery/bok choy
Cabbage-green and red
Cabbage-savoy
Cactus pads (nopal)
Cauliflower
Celery
Chicory (french or belgian endive)
Chili peppers (jalapeno)
Chives
Cucumbers
Eggplant
Garlic
Kohlrabi
Leeks
Lotus root
Mushrooms
Okra
Olives
Onions-dry-bulb (cipollini)
Onions-green
Parsley roots
Peppers-other
Peppers-sweet(garden)
Pimentos
Seaweed
Snowpeas
Soybeans-sprouted seeds
Squash-summer
Water chestnuts

20. VEGETABLE JUICE: 182g

Food Code range: 7430110-7430400, 7310501

Commodities include:

Tomato juice
Celery juice

FRUIT GROUP

1. GRAPEFRUIT, raw or cooked: 115g

Food Code range: 63110101-6110123

Commodities include:

Grapefruit-peeled fruit

2. LEMON, raw: 106G

Food Code range: 6110301

Commodities include:

Lemons-peeled fruit

3. LIME, raw: 67g

Food Code range: 6110601

Commodities include:

Limes-peeled fruit

4. ORANGE, raw: 102G

Food Code range: 6111901-611902

Commodities include:

Oranges-peeled fruit

5. TANGELO AND TANGERINE, raw: 123G

Food Code range: 6112500-6112501

Commodities include:

Tangelos

Tangerines

6. CITRUS JUICE (6 fl oz is Pyramid serving size): 187G

Food Code range: 6120010-6121663 (Excluding codes for concentrates not reconstituted)

Commodities include:

Grapefruit-juice

Lemon-juice

Lime-juice

Orange-juice

Tangerines-juice

FRUIT GROUP (cont'd)

7. CITRUS JUICE, CONCENTRATED: 47g

Food Code range: 6121072-6121073

Commodities include:

Grapefruit-juice-concentrate
Lemon-juice-concentrate
Lime-juice-concentrate
Orange-juice-concentrate
Tangerines-juice-concentrate

8. APPLE, raw: 63G

Food Code range: 6310100-6310150

Commodities include:

Apples

9. APRICOT, raw: 83G

Food Code range: 6310301-6310150

Commodities include:

Apricots

10. AVOCADO, raw: 75G

Food Code range: 6310501

Commodities include:

Avocados

11. BANANA, raw: 112G

Food Code range: 6310701-6310741

Commodities include:

Bananas
Bananas-other varieties

12. MELONS, raw: 82G

Food Code range: 6310901-6310961, 6312701-6312761

Commodities include:

Cantaloupes-pulp (muskmelon)
Honeydew melons

FRUIT GROUP (cont'd)

13. CHERRIES, raw: 72G

Food Code range: 6311301-6311517

Commodities include:

Cherries

14. FIG, raw: 50G

Food Code range: 6311901-6311914

Commodities include:

Figs

15. GRAPES, EUROPEAN, raw: 80G

Food Code range: 6312301-6312313

Commodities include:

Grapes

16. MANGO, raw: 82G

Food Code range: 6312901-6312903

Commodities include:

Mangoes

17. KIWI FRUIT, raw: 88G

Food Code range: 6312650

Commodities include:

Kiwi fruit

18. NECTARINES, raw: 78G

Food Code range: 6313101-6313111

Commodities include:

Nectarines

FRUIT GROUP (cont'd)

19. PEACH, raw: 92G

Food Code range: 6313501-6313566

Commodities include:

Peaches

20. PEAR, raw: 82G

Food Code range: 6313701

Commodities include:

Pears

21. PINEAPPLE, raw: 78G

Food Code range: 6314101-6314117

Commodities include:

Pineapples-peeled fruit

22. PLUM, raw: 82g

Food Code range: 6314301-6314365

Commodities include:

Plums (Damson)

23. RHUBARB, raw: 61G

Food Code range: 6314701-6314762

Commodities include:

Rhubarb

24. WATERMELON, raw: 76G

Food Code range: 6314901

Commodities include:

Watermelon

FRUIT GROUP (cont'd)

25. OTHER non citrus, raw: 63G

Food Code range: 6310010-6314902 excluding those listed in other categories

Commodities include:

Quinces
Loquats
Carambola(Starfruit)
Genip(Spanish lime)
Guava
Papayas-green
Papayas-pulp
Passion fruit (Granadilla)
Pomegranates
Lychees (Litchi)
Persimmons
Acerola
Maney (Mammee apple)
Sugar apples (sweetsop)
Jackfruit
Jobo
Tamarind
Wi-apple
Sapodilla

26. BERRIES: 72G

Food Code range: 6320010-6322362

Commodities include:

Blackberries
Boysenberries
Dewberries
Loganberries
Raspberries
Youngberries
Blueberries
Cranberries
Currants
Elderberries
Gooseberries
Huckleberries (Gaylussacia)
Strawberries
Juneberry
Mulberries

FRUIT GROUP (cont'd)

27. NON CITRUS JUICE: 18G

Food Code range: 6410010-6413310

Commodities include:

Cranberries-juice
Grapes-juice
Apples-juice/cider
Cherries-juice
Plums/Prune-juice
Papayas-juice
Pineapples-juice
Cantaloupes-nectar
Bananas-nectar
Blackberries-juice
Guava-nectar
Passion fruit-nectar
Peaches-juice
Pears-nectar
Apricot juice or nectar
Strawberries-juice

28. NON CITRUS JUICE, CONCENTRATED: 47g

Commodities include:

Apple juice concentrate
Cranberries juice concentrate
Grapes juice concentrate
Pineapples juice concentrate

29. DRIED APPLE: 21G

Food Code range: 6210110-6210115

Commodities include:

Apples-dried

30. DRIED APRICOT, PRUNE, PINEAPPLE: 33G

Food Code range: 6210410, 6212010, 6212210

Commodities include:

Apricots-dried
Plums-prunes-dried
Pineapples-dried

FRUIT GROUP (cont'd)

31. RAISINS: 36G

Food Code range: 6212510

Commodities include:

Grapes-raisins

32. BANANA FLAKES AND CHIPS: 24G

Food Code range: 6210710-6210720

Commodities include:

Bananas-dried

33. DRIED DATE, FIG, PEACH, AND PEAR: 45g

Food Code range: 6211010, 6211310, 6211610, 6211910

Commodities include:

Dates

Figs

Peaches-dried

Pears-dried

34. OTHER DRIED FRUIT: 34G

Food Code range: 6210810, 6211400, 6211411, 6212110

Commodities include:

Papayas-dried

Cherries-dried

APPENDIX B

PORTION SIZE COMPARISONS

In general, the portion size coding for the food group analysis was guided by the portion size examples that are presented in the Food Pyramid Booklet. However, as noted in the text, only a limited number of examples are given there. In addition, these examples are not always fully consistent with one another. Therefore, to assure as much consistency as possible, for some foods the coding assumptions depart somewhat from specific examples in the Food Pyramid Booklet. The following notes provide comparison information between the information implied by the coding on servings per 100 grams as compared to the information implied by the food booklet on servings per 100 grams.

APPENDIX B
PORTION SIZE COMPARISONS

BREAD, CEREAL, RICE AND PASTA GROUP	PYRAMID SERVING SIZE	USDA FOOD CODES	# PYR SERVS/100G	# TAS SERV/100G
Bread	1 slice	5110100	3.85	3.97
Hamburger roll, bagel, english muffin	1/2 roll, bagel or muffin	5115000 (hamburger roll) 5118003 (bagel) 5118601 (English muffin) 5118601 (English muffin, toasted)	4.65 3.64 3.45 4.00	3.80 3.86 3.66 4.27
Tortilla	1 tortilla	5221520 one 3" one 4" one 5" one 6" one 7" one 8" one 9" one 10" one 12"	14.29 7.69 5.00 3.45 2.50 1.92 1.52 1.23 0.85	4.44

APPENDIX B (cont'd)

BREAD, CEREAL, RICE AND PASTA GROUP	PYRAMID SERVING SIZE	USDA FOOD CODES	# PYR SERVS/ 100G	# TAS SERV/ 100G
Rice, pasta, cooked	1/2 cup cooked	5620500 (rice, regular) hot cold 5620504 (converted rice) hot cold 5610100 (macaroni) 5611201 (noodles)	0.98 1.38 1.14 1.38 1.43 1.25	1.13 0.98 1.43 1.34
Plain crackers ¹	3-4 small crackers	5430100 (butter crackers) 3, 3g crackers 4, 4g crackers 5433400 (toast thins) 3 crackers 4 crackers	11.10 6.25 16.67 12.50	5.32 5.00
Breakfast cereal	1 oz. cereal	5712400 (Chex) 5712300 (Cheerios) 5710300 (Alphabits-these are 40% sugar) 5724380 (Ice Cream Cones cereal- these are 46% sugar and 8% fat)	3.57 3.57 3.57 3.57	3.27 3.41 2.11 1.48
Pancakes (4" diameter) ²	1 pancake	5510100	4.76	1.74

¹According to the Pyramid recommendations, you can obtain the full Pyramid 11 servings of grain products with 2 cups of Ritz crackers or 1-1/2 cups Goldfish.

APPENDIX B (cont'd)

BREAD, CEREAL, RICE AND PASTA GROUP	PYRAMID SERVING SIZE	USDA FOOD CODES	# PYR SERVS/ 100G	# TAS SERV/ 100G
Croissant	1/2 large croissant	5116600 frozen fresh 5116650 apple strawberry	4.76 3.57 2.17 2.50	3.32 2.34
Doughnut	1 ounce or 1/2 medium doughnut	5352011 (cake type) 5352111 (raised)	4.76 3.33	2.09 2.28
Danish	1 ounce or 1/2 medium danish	5351000 (with fruit) 5351100 (with cheese)	2.13 1.79	2.96 2.16
Cake	1/16 average cake	5312006 (white cake - 52% sugar; 13% fat) 1-layer tube cake 2-layer 5310210 (applesauce cake- 25% sugar; 12% fat) loaf cake tube cake	2.44 1.42 1.22 2.56 1.53	0.92 1.27

²21 grams of pancake (one serving according to Pyramid) contains much less flour than 25 grams (one serving according to the Pyramid) of bread. Pancake contains 5.25 grams of flour; slice of bread 14.7-15.7 grams of flour.

APPENDIX B (cont'd)

BREAD, CEREAL, RICE AND PASTA GROUP	PYRAMID SERVING SIZE	USDA FOOD CODES	# PYR SERVS/ 100G	# TAS SERV/ 100G
Cookies ³	2 medium cookies	5320600 (choc. chip) 5320900 (Oreo) 5321550 (coconut) 5322650 (Rice Krispies bar) 5323310 (oatmeal with chocolate and peanut butter)	5.00 4.50 3.12 1.67 1.47	1.46 2.76 1.47 2.20 1.52
Pie, fruit, 2 crust ⁴	1/6 of an 8" pie	5330100 (Apple 8" diam.) 1/6 pie 1/8 pie		0.77 1.02 1.69

³According to Pyramid, one grain serving = 2 cookies (about 20 grams) or 1 slice of bread (about 26 grams). Not only are these weights "favoring" cookies over bread, i.e., one gets more grain credit for eating cookies than bread but cookies are only about 30% grain while bread is 60% grain.

⁴Most USDA weights are based on 1/8 of pie, not 1/6 pie.

APPENDIX B (cont'd)

VEGETABLE GROUP	PYRAMID SERVING SIZE	USDA FOOD CODES	# PYR SERVS/ 100G	# TAS SERV/ 100G
Vegetables, cooked	1/2 cup	7310221 (carrots) fresh, nfs fresh, sliced frozen, sliced mashed 7520498 (string beans) fresh frozen 7521600 (corn)	1.29 1.24 1.32 0.86 1.53 1.42 1.18	1.58 1.42 1.25
Vegetables, leafy, raw	1 cup	7511300 (lettuce)	1.82	1.82
Vegetables, nonleafy, raw, chopped	1/2 cup	7220110 (broccoli) 7510900 (celery) 7511100 (cucumber) unpared, chopped pared, chopped sliced	2.27 1.67 1.40 1.50 1.68	2.27 1.67 1.67
Potatoes, scalloped	1/2 cup	7130501	0.88	0.85
Potato salad	1/2 cup	7160301 7160201 (German)	1.03 1.14	1.20 1.11
French fries	10 strips	7140100 1-2" 2-3.5" 3.5-4"	2.86 2.00 1.28	1.11

APPENDIX B (cont'd)

FRUIT GROUP	PYRAMID SERVING SIZE	USDA FOOD CODES	# PYR SERVS/ 100G	#TAS SERV/ 100G
Medium raw fruit (apple, orange, banana) - whole and 1/2 cup	1 fruit	6110101 (grapefruit)	0.77	0.87
	1/2 cup	6111901 (orange) 1 medium	0.76	0.98
		1/2 cup	0.98	
		6310100 (apple) 1 medium	0.72	1.59
		1/2 cup, chopped	1.60	
		6310701 (banana) 1 medium	0.87	0.89
		1/2 cup, sliced	1.33	
		6313501 (peach) 1 medium	1.02	1.09
		1/2 cup	1.08	
		6314101 (pineapple) 1/2 cup	1.29	1.28
		6320101 (blackbr) 1/2 cup	1.38	1.39
		6322302 (strawbr) 1/2 cup	1.32	1.39
Fruit, cooked or canned	1/2 cup	6310112 (apple) 6313513 (peach) 6314113 (pineapple)	1.17 0.76 0.79	1.25 0.70 0.71

APPENDIX B (cont'd)

FRUIT GROUP	PYRAMID SERVING SIZE	USDA FOOD CODES	# PYR SERVS/ 100G	#TAS SERV/ 100G
Fruit juice, unsweetened	3/4 cup	6121001 (orange juice) 6410401 (apple juice)	0.54 0.54	0.53 0.53
Avocado	1/4 whole	6310501 California Florida	2.31 1.32	1.33

APPENDIX B (cont'd)

MILK, YOGURT, AND CHEESE GROUP	PYRAMID SERVING SIZE	USDA FOOD CODES	# PYR SERVS/ 100G	#TAS SERV/ 100G
Skim milk	1 cup	1111300	0.41	0.42
Yogurt, plain, whole milk	1 cup 8 ounces - weight 8 fluid ounces	1141110	0.44 0.41	0.42
Nonfat yogurt, plain	8 ounces - weight 8 fluid ounces	1141130	0.44 0.41	0.70
Lowfat milk, 2%	1 cup	1111200	0.41	0.41
Whole milk	1 cup	1111100	0.41	0.40
Chocolate milk, 2%	1 cup	1151120	0.40	0.41
Lowfat yogurt, plain	8 ounces - weight 8 fluid ounces	1141120	0.44 0.41	0.64
Lowfat yogurt, fruit	8 ounces - weight 8 fluid ounces	1143200	0.44 0.41	0.54
Natural cheddar cheese	1-1/2 ounces	1410401	2.35	2.33
Process cheese	2 ounces	1441020	1.76	1.75
Mozzarella, part skim	1-1/2 ounces	1410701	2.35	2.33
Ricotta, part skim	1/2 cup	1420150	0.81	1.25
Cottage cheese, 4% fat	2 cups	1420010	0.95	1.40
Ice cream	1-1/2 cups	1311000	0.50	0.45
Ice milk	1-1/2 cups	1313010	0.51	0.50
Frozen yogurt	1 cup	1146010	0.52	0.52

APPENDIX B (cont'd)

MEAT, POULTRY, FISH, DRY BEANS, EGGS, AND NUTS GROUP	PYRAMID SERVING SIZE	USDA FOOD CODES	# PYR SERVS/ 100G	#TAS SERV/ 100G
Lean meat, poultry, fish, cooked	3 ounces*	211-0102 beef steak, lean only eaten 241-2112 chicken breast, broiled, skin not eaten 261-2516 ocean perch, steamed or poached	3.57 3.57 3.57	3.58 3.55 3.57
Ground beef, lean, cooked	3 ounces*	215-0120 ground beef, lean, cooked	3.57	3.17
Chicken, with skin, fried	3 ounces*	241-5721 chicken thigh, battered, fried, skin eaten	3.57	2.34
Bologna	2 slices = 1 ounce equiv.	252-2041 bologna, NFS	1.78	2.19
Egg	1 egg = 1 ounce equiv.	311-0400 egg, whole, poached	2.00	1.99
Dry beans and peas, cooked	1/2 cup = 1 ounce equiv.	411-0401 - pinto, calico, and red Mexican beans, cooked NS as to fat added in cooking	0.86	0.85
Peanut butter	2 tbsp = 1 ounce equiv.	422-0200 peanut butter	3.12	3.11
Nuts	1/3 cup = 1 ounce equiv.	421-1020 mixed nuts, dry roasted	2.19	2.11

APPENDIX C
VARIETY CODING

As described in the text of the report, the score on the tenth component of the Healthy Eating Index is based on the number of different types of foods consumed by sample members over the observation period. In calculating this value from the data, similar foods (e.g. boiled potatoes and baked potatoes) are combined into the same category. In particular, the coding process resulted in the aggregation of the approximately 4,000 7-digit food codes in the initial data set into approximately 350 categories of food. The notes presented below provide an overview of this coding structure by listing the individual food codes which were retained as generic categories. A complete description of the coding structure is available in the form of the actual data file which contains the final coding. This file is available upon request from Mathematica Policy Research.

APPENDIX C

GENERIC NAMES FOR FOOD CODES TO WHICH ALL USDA CODES USED IN THE VARIETY INDEX WERE MAPPED

MILK GROUP:

1111600	MILK, GOAT'S
1110000	MILK AND MILK PRODUCTS, PLAIN
1151100	MILK AND MILK PRODUCTS, SWEETENED AND/OR FLAVORED (INCLUDE CHOCOLATE MILK, NS AS TO MILK OR DRINK)
1320011	PUDDING
1321030	CUSTARD
1321050	PUDDING, TAPIOCA
1325000	MOUSSE
1321011	PUDDING, BREAD
1321041	PUDDING, RICE
1321061	PUDDING, COCONUT
1321071	PUDDING, INDIAN
1321075	PUDDING, PUMPKIN
1401000	CHEESE
1420010	CHEESE, COTTAGE

MEAT, POULTRY, FISH, DRY BEANS, EGGS AND NUTS:

MEAT AND POULTRY

2100010	BEEF
2200010	PORK
2230012	HAM
2300010	LAMB
2315010	GOAT
2320010	VEAL
2331000	RABBIT
2332100	VENISON
2332310	MOOSE
2332350	BEAR
2332410	CARIBOU
2333110	GROUND HOG
2333210	OPOSSUM
2333310	SQUIRREL
2333410	BEAVER
2333510	RACCOON
2334010	ARMADILLO
2334510	WILD PIG
2410000	CHICKEN
2420100	TURKEY
2430010	DUCK
2431101	GOOSE
2440000	CORNISH GAME HEN

APPENDIX C (cont'd)

MEAT, POULTRY, FISH, DRY BEANS, EGGS AND NUTS (cont'd):

MEAT AND POULTRY (cont'd)

2440210	DOVE
2440310	QUAIL
2440410	PHEASANT (INCLUDE GROUSE)
2510001	LIVER
2512000	HEART
2513000	KIDNEY
2514011	SWEETBREADS
2515000	BRAINS
2516000	TONGUE
2517011	TRIPE
2517041	GIBLETS
2521011	FRANKFURTER, WIENER, OR HOT DOG
2522001	COLD CUT
2522010	SAUSAGE

FISH, SHELLFISH, AND OTHER SEAFOOD

2610010	FISH
2610111	ANCHOVY
2610311	BARRACUDA
2610511	CARP (INCLUDE BREAM, BUFFALO FISH, CHUB, SUCKER)
2610711	CATFISH (INCLUDE BULLHEAD)
2610911	COD
2611111	CROAKER (INCLUDE ANGELFISH, BUTTERFLY FISH, DRUMFISH, GOATFISH, KINGFISH, SEA TROUT, FRESHWATER SHEEPSHEAD, SPADEFISH, SPOT, SURGEONFISH, WEAKFISH, WEKE)
2611311	EEL
2611500	FLounder (INCLUDE DAB, FLUKE, HALIBUT, SOLE, TURBOT)
2611711	HADDOCK (INCLUDE BURBOT, CUSK, HAKE, LING, MONKFISH, POLLOCK, SCROD)
2611910	HERRING (INCLUDE ALEWIFE, MILKFISH, SHAD)
2612110	MACKEREL (INCLUDE ENENUI, GARFISH, ONO, NEEDLEFISH, WAHOO)
2612310	MULLET
2612510	OCEAN PERCH (INCLUDE BOCACCIO, MENPACHI, ORANGE ROUGHY, REDFISH, ROCKFISH)
2612711	PERCH (INCLUDE FRESHWATER BASS, BLUEGILL, CRAPPIE, SUNFISH, WALLEYE)
2612911	PIKE (INCLUDE MUSKELLUNGE, PICKEREL)
2613110	POMPANO (INCLUDE AKULE, BLACKFISH, BLUEFISH, BUTTERFISH, DOLPHINFISH, JACK, MAHIMAHIA, PAPLO, PARROT FISH, SABLEFISH, SCAD, TILEFISH, ULVA, YELLOWTAIL)
2613310	PORGY (INCLUDE SCUP, SEA BREAM, MARINE SHEEPSHEAD, SNAPPER)
2613511	RAY (INCLUDE SKATE)

APPENDIX C (cont'd)

MEAT, POULTRY, FISH, DRY BEANS, EGGS AND NUTS (cont'd):

FISH, SHELLFISH, AND OTHER SEAFOOD (cont'd)

2613710	SALMON (INCLUDE SALTWATER TROUT)
2613911	SARDINES
2614111	SEA BASS (INCLUDE GROPER, STRIPED BASS, WREAKFISH)
2614311	SHARK (INCLUDE DOGFISH, GRAYFISH)
2614511	SMELT (INCLUDE CAPELIN)
2614711	STURGEON
2614911	SWORDFISH (INCLUDE MARLIN)
2615111	TROUT (INCLUDE CISCO, LAKE HERRING, STEELHEAD, WHITEFISH)
2615310	TUNA (INCLUDE AHI, AKU, BONITO)
2615711	WHITING
2620311	FROG LEGS
2620418	JELLYFISH
2620511	OCTOPUS
2620711	ROE, COD AND SHAD
2621210	SEA URCHIN (ROE)
2621310	SQUID (INCLUDE CUTTLEFISH)
2621512	TURTLE (TERRAPIN)
2630111	ABALONE
2630310	CLAMS
2630511	CRAB (INCLUDE WHITE AND KING CRAB MEAT)
2630914	CRAYFISH
2631111	LOBSTER (INCLUDE SPINY LOBSTER; ROCK LOBSTER)
2631310	MUSSELS
2631510	OYSTERS
2631711	SCALLOPS
2631911	SHRIMP (INCLUDE PRAWN)
2632111	SNAILS
2840000	GELATIN

EGGS

3110101	EGG
3300010	EGG SUBSTITUTE

DRY BEANS, NUTS, SEEDS

4110100	BEANS, DRY
4110700	SOYBEANS
4130100	DRIED PEAS, LENTILS
	COWPEAS, DRY (INCLUDE BLACKEYE PEAS, FIELD PEAS)
4141001	SOYBEAN DERIVED PRODUCTS:
	SOY NUTS (INCLUDE PERNUTS)
4142001	BEAN CURD (TOFU)

APPENDIX C (cont'd)

MEAT, POULTRY, FISH, DRY BEANS, EGGS AND NUTS (cont'd):

DRY BEANS, NUTS, AND SEEDS (cont'd)

4143000	PROTEIN SUPPLEMENT, MEAL REPLACEMENT SOY-BASED	PROTEIN POWDER
4146001	HI-PROTEIN WAFERS (INCLUDE HI-PROTEIN OATMEAL WAFER)	
4181020	MEAT SUBSTITUTES, MAINLY VEGETABLE PROTEIN	
	BACON STRIPS, MEATLESS (INCLUDE MORNING STAR BREAKFAST	
	STRIPS, STRIPPLE)	
4148000	TOFU (INCLUDE TOFUTTI)	
4210010	ALMONDS	
4210200	BRAZIL NUTS	
4210300	BUTTER NUTS	
4210400	CASHEW NUTS	
4210500	CHESTNUTS	
4210600	COCONUT MEAT	
4210700	FILBERTS, HAZEL NUTS	
4210750	GINKGO NUTS	
4210800	HICKORY NUTS	
4210900	MACADAMIA NUTS	
4211000	MIXED NUTS	
4211100	PEANUTS	
4211200	PECANS	
4211300	PINE NUTS (PIGNOLIAS)	
4211400	PISTACHIO NUTS	
4211600	WALNUTS	
4310010	BREADNUTS	
4310100	PUMPKIN AND/OR SQUASH SEEDS	
4310200	SUNFLOWER SEEDS, HULLED	
4310300	SESAME SEEDS	
4310400	FLAX SEEDS	
4310700	MIXED SEEDS	
4410100	CAROB POWDER OR FLOUR	

BREADS, CEREALS, RICE, AND PASTA:

5100010	BREADS, ROLLS, WHITE FLOUR BASED,
5116000	BREADS, ROLLS, SWEET OR WITH ADDED INGREDIENTS
5120101	BREAD, ROLLS, WHOLE WHEAT, 100%
5120111	BREAD, WHOLE WHEAT, 100%, WITH RAISINS
5130011	BREAD, WHOLE WHEAT
5130022	BREAD, WHOLE WHEAT, NS AS TO 100%, WITH RAISINS
5130201	BREAD, BRAN (INCLUDE GRANOLA, BRANOLA, HONEY BRAN)
5130252	MUFFIN, ENGLISH, BRAN, WITH RAISINS
5140101	BREAD, ROLLS, RYE/PUMPERNICKEL (INCLUDE CORN RYE)
5150101	BREAD, ROLLS OATMEAL
5160101	BREAD, ROLLS, MULTIGRAIN

APPENDIX C (cont'd)

BREADS, CEREALS, RICE, AND PASTA (cont'd):

5160121	BREAD, MULTIGRAIN, WITH RAISINS
5180602	BREAD, RICE
5220100	CORBREAD CORNMEAL-BASED (INCLUDE JALAPENO CORNBREAD)
5510500	PANCAKES, BUCKWHEAT
5310010	CAKE, WHEAT FLOUR
5311540	CAKE, OATMEAL
5312410	CAKE, ZUCCHINI
5320100	COOKIE
5330572	PIE
5334700	PIE, PUMPKIN
5440300	POPCORN
5610100	MACARONI (INCLUDE LASAGNA NOODLES, ORZO, ZITI, ROTINI, SHELLS, WAGON WHEELS, CART WHEELS, MANICOTTI, RIGATONI, MOSTACCIOLI, CAVATONI RICCI, BOWS, TWIRLS, SPIRALS)
5610200	MACARONI, WHOLE WHEAT (INCLUDE LASAGNA NOODLES, ORZO, ZITI, ROTINI, SHELLS, WAGON MANICOTTI, RIGATONI, MOSTACCIOLI, CAVATONI RICCI, BOWS, TWIRLS, SPIRALS)
5614000	PASTA, CORN-BASED (INCLUDE MACARONI, NOODLES, SPAGHETTI)
5611700	RICE NOODLES
5620040	BARLEY (INCLUDE EGG BARLEY)
5620050	BUCKWHEAT GROATS (INCLUDE KASHA)
5620100	GRITS
5620200	MILLET
5620300	OATMEAL
5620500	RICE (INCLUDE YELLOW RICE)
5620511	RICE, BROWN
5620521	RICE, WILD
5620700	WHEAT, CREAM OF (INCLUDE FARINA)
5620711	BULGUR (INCLUDE WHEAT PILAF)
5620720	WHOLE WHEAT CEREAL (INCLUDE WHEATENA, RALSTON, ZOOM, ROMAN MEAL, BRANOLA, HOME GROUND CEREAL, ROMAN MEAL WITH OATS)
5620800	MULTI-GRAIN CEREAL (INCLUDE SEVEN-GRAIN CEREALS)

FRUIT:

6110050	CALAMONDIN
6110101	GRAPEFRUIT (INCLUDE CHIRONJA)
6111001	KUMQUAT
6111301	LEMON
6111601	LIME
6111901	ORANGE
6112500	TANGELO
6112501	TANGERINE (INCLUDE MANDARIN ORANGE, FRESH; SATSUMA)
6120050	ACEROLA JUICE

APPENDIX C (cont'd)

FRUIT (cont'd):

6120100	GRAPEFRUIT JUICE
6120400	LEMON JUICE
6120700	LIME JUICE
6121000	ORANGE JUICE
6121300	TANGERINE JUICE
6210100	FRUIT, DRIED
6310301	APRICOT
6310701	BANANA
6311701	CURRANTS
6211010	DATE
6311901	FIG
6312651	LYCHEE
6313301	PAPAYA
6313501	PEACH
6314101	PINEAPPLE
6314301	PLUM
6212210	PRUNE
6212510	RAISINS
6212600	TAMARIND PULP, DRIED
6310100	APPLE
6310301	APRICOT
6310501	AVOCADO
6310901	CANTALOUPE (MUSKMELON)
6310975	CARAMBOLA (STARFRUIT)
6311101	CHERRIES, MARASCHINO
6311200	ACEROLA
6311301	CHERRIES
6312101	GENIP
6312300	GRAPES
6312501	GUAVA
6312521	JACKFRUIT
6312601	JUNEBERRY
6312650	KIWI FRUIT
6312701	HONEYDEW MELON
6312901	MANGO
6313101	NECTARINE
6313401	PASSION FRUIT
6313701	PEAR, RAW
6314501	POMEGRANATE
6314601	QUINCE
6314701	RHUBARB
6314790	SAPODILLA
6314801	SUGAR APPLE
6314850	SOURSOP (ANNONA MURICATA)
6212600	TAMARIND PULP, DRIED, SWEETENED ("PULPITAS")
6314901	WATERMELON
6320010	BERRIES

APPENDIX C (cont'd)

FRUIT (cont'd):

6320101	BLACKBERRIES (INCLUDE DEWBERRIES, YOUNGBERRIES, MARIONBERRIES)
6320301	BLUEBERRIES
6320700	CRANBERRIES
6321101	ELDERBERRIES
6321301	GOOSEBERRIES
6321501	LOGANBERRIES
6321701	MULBERRIES
6321900	RASPBERRIES
6322302	STRAWBERRIES
6331100	FRUIT COCKTAIL OR MIX (EXCLUDING CITRUS FRUITS)
6212210	PRUNES
6340902	CHUTNEY
6410010	FRUIT JUICE
6410101	APPLE JUICE
6410460	BLACKBERRY JUICE
6410540	CRANBERRY JUICE
6411601	GRAPE JUICE
6412001	PAPAYA JUICE
6412100	PASSION FRUIT JUICE (INCLUDE YELLOW, LILIKOI)
6412203	PEACH JUICE
6412401	PINEAPPLE JUICE
6413201	PRUNE JUICE
6413250	STRAWBERRY JUICE
6413310	WATERMELON JUICE
6420101	APRICOT NECTAR
6420150	BANANA NECTAR
6420201	CANTALOUPE NECTAR
6420302	GUAVA NECTAR
6420401	MANGO NECTAR
6420501	PEACH NECTAR
6421001	PAPAYA NECTAR
6421301	PASSION FRUIT NECTAR
6421501	PEAR NECTAR
6422101	SOURSOP (GUANABANA) NECTAR

VEGETABLES

7100010	WHITE POTATO
7190010	PLANTAIN
7193009	CASSAVA, YUCA BLANCA
7194501	YAM, PUERTO RICAN
7195001	TANNIER
7196201	DASHEEN
7210121	BEET GREENS
7210420	CHARD
7210720	COLLARDS

APPENDIX C (cont'd)

VEGETABLES (cont'd):

7211022	CRESS
7211310	DANDELION GREENS
7211600	ENDIVE, CHICORY, ESCAROLE, OR ROMAINE
7211921	KALE
7212220	MUSTARD GREENS
7212302	POKE GREENS
7212510	SPINACH
7212820	TURNIP GREENS
7213010	WATERCRESS
7220110	BROCCOLI
7310101	CARROTS
7320100	PUMPKIN
7330100	SQUASH, WINTER TYPE
7340100	SWEETPOTATO
7410100	TOMATOES
7430110	TOMATO JUICE AND PLAIN SAUCES
7510050	ALFALFA SPROUTS
7510075	ARTICHOKE, JERUSALEM
7510080	ASPARAGUS
7510100	BEAN SPROUTS
7510180	BEANS, STRING, GREEN
7510250	BEETS
7510300	CABBAGE
7510400	CABBAGE, CHINESE
7510500	CABBAGE, RED
7510700	CAULIFLOWER
7510900	CELERY
7510950	CHIVES
7510960	CORN
5711100	CUCUMBER
7511150	GARLIC
7511180	JICAMA
7511200	KOHLRABI
7511300	LETTUCE
7511306	LETTUCE, BOSTON
7511500	MUSHROOMS
7511701	ONIONS, YOUNG GREEN
7511702	ONIONS, MATURE
7511900	PARSLEY
7512000	PEAS, GREEN
7512100	PEPPER, HOT CHILI
7512210	PEPPER, SWEET GREEN
7512220	PEPPER, SWEET RED
7512500	RADISH
7512775	SNOW PEAS
7512800	SQUASH, SUMMER, YELLOW
7512900	TURNIP

APPENDIX C (cont'd)

VEGETABLES (cont'd):

7514300	LETTUCE SALAD
7520100	ARTICHOKE, GLOBE
7520300	BAMBOO SHOOTS
7520400	BEANS, LIMA
7520600	BEANS, STRING, YELLOW
7520829	BITTER MELON
7520900	BRUSSELS SPROUTS
7521311	CACTUS
7521700	EGGPLANT
7521730	FLOWERS OR BLOSSOMS OF SESBANIA, SQUASH, OR LILY
7522000	OKRA
7522201	PARSNIPS
7522800	RUTABAGA
7523200	SEAWEED
7523320	SQUASH, SPAGHETTI
7523500	WATER CHESTNUT
7531100	MIXED VEGETABLES
7534000	VEGETABLE COMBINATION
7550309	HORSERADISH
7551000	OLIVES